Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method, comprising:

exposing a surface to a first gas composition under conditions sufficient to deposit a layer of a first chalcogenide glass on the surface, wherein exposing the surface to the first gas composition comprises activating a plasma in the first gas composition; and

exposing the layer of the first chalcogenide glass to a second gas composition under conditions sufficient to deposit a layer of a second glass on the layer of the first chalcogenide glass, wherein the second glass is different from the first chalcogenide glass and exposing the layer of the first chalcogenide glass to the second gas composition comprises activating a plasma in the second gas composition and moving the plasma in a direction non-normal to a surface of the first chalcogenide glass layer.

2. Cancelled

3. (Previously presented) The method of claim 1 of, wherein activating a plasma in the first gas composition comprises exposing the gas to electromagnetic radiation to activate the plasma.

4. (Original) The method of claim 3, wherein the electromagnetic radiation comprises microwave radiation.

5. (Original) The method of claim 3, wherein the electromagnetic radiation comprises radio frequency radiation.

6. (Original) The method of claim 1, wherein exposing the layer of the first glass to the second gas composition comprises activating a plasma in the second gas composition.

7. (Original) The method of claim 6, wherein activating a plasma in the second gas composition comprises exposing the gas to electromagnetic radiation to activate the plasma.

8. (Original) The method of claim 7, wherein the electromagnetic radiation comprises microwave radiation.

9. (Original) The method of claim 7, wherein the electromagnetic radiation comprises radio frequency radiation.

10. (Original) The method of claim 1, wherein the second gas composition is different from the first gas composition.

11. (Original) The method of claim 1, wherein the first gas composition comprises one or more halide compounds.

12. (Original) The method of claim 11, wherein the one or more halide compounds comprises a chloride compound.

13. (Original) The method of claim 1, wherein the first gas composition comprises a carrier gas.

14. (Original) The method of claim 13, wherein the carrier gas comprises nitrogen.

15. (Original) The method of claim 13, wherein the carrier gas comprises a noble gas.

16. (Original) The method of claim 15, wherein the noble gas is argon.

17. (Original) The method of claim 1, wherein the first gas composition comprises a chalcogen.

18. (Original) The method of claim 1, wherein the first gas composition pressure is between about 2 and 20 Torr.

19. (Original) The method of claim 1, wherein the second gas composition comprises one or more halide compounds.

20. (Original) The method of claim 19, wherein the one or more halide compounds comprises a chloride compound.

21. (Original) The method of claim 1, wherein the second gas composition comprises a carrier gas.

22. (Original) The method of claim 21, wherein the carrier gas comprises nitrogen.

23. (Original) The method of claim 21, wherein the carrier gas comprises a noble gas.

24. (Original) The method of claim 23, wherein the noble gas is argon.

25. (Original) The method of claim 1, wherein the second gas composition comprises a chalcogen.

26. (Original) The method of claim 1, wherein the second gas composition comprises oxygen.

27. (Original) The method of claim 1, wherein the second gas composition pressure is between about 2 and 20 Torr.

28. (Original) The method of claim 1, wherein the second glass is an oxide glass.

29. (Original) The method of claim 1, wherein the second glass is a chalcogenide glass.

30. (Original) The method of claim 1, wherein the surface is a surface of a tube.

31. (Original) The method of claim 30, wherein the surface is an inner surface of a tube.

32. (Original) The method of claim 30, wherein the tube comprises a glass.

33. (Original) The method of claim 32, wherein the glass is a silicate glass.

34. (Previously presented) The method of claim 30, wherein the tube comprises a polymer.

35. (Original) The method of claim 1, wherein the surface is a planar surface.

36. (Currently Amended) A method, comprising:

introducing a first gas composition into a tube having an inner surface formed from a chalcogenide glass, the first gas composition comprising a first compound that is substantially inert with respect to the chalcogenide glass ~~a first material forming the inner surface of the tube~~; and

exposing the first gas composition to conditions sufficient to change the first compound into a second compound to deposit a layer of ~~a second material~~ an oxide glass on the inner surface of the tube~~,~~

wherein, relative to an alternative first gas composition that includes the second compound instead of the first compound, ~~the second compound adversely reacts with the first material to form undesired impurities on the inner surface of the tube and the introduction of~~ the first gas composition reduces ~~the~~ undesired impurities that form on the inner surface of the tube ~~relative the introduction of a gas composition including the second compound.~~ due to oxidation of the chalcogenide glass by the second compound.

37. (Original) The method of claim 36, wherein exposing the first gas composition to conditions sufficient to change the first compound into a second compound comprises activating a plasma in the first gas composition.

38. (Original) The method of claim 37, wherein activating the plasma comprises exposing the first gas composition to electromagnetic radiation.

39. (Original) The method of claim 38, wherein the electromagnetic radiation comprises microwave radiation.

40. (Original) The method of claim 38, wherein the electromagnetic radiation comprises radio frequency radiation.

41. (Original) The method of claim 36, wherein the first compound comprises oxygen.

42. (Original) The method of claim 41, wherein the first compound is nitrous oxide.

43. (Original) The method of claim 42, wherein the second compound is oxygen.

44-46. Cancelled

47. (Previously Presented) A method, comprising:

exposing a surface to a first gas composition under conditions sufficient to deposit a layer of a first chalcogenide glass on the surface; and

exposing the layer of the first chalcogenide glass to a second gas composition under conditions sufficient to deposit a layer of a second glass on the layer of the first chalcogenide glass, wherein the second glass is an oxide glass <u>and exposing the layer of the first chalcogenide glass to the second gas composition comprises activating a plasma in the second gas composition</u>.

48. Cancelled

49. (Previously Presented) The method of claim 1, wherein the first chalcogenide glass has a refractive index n_1 at a wavelength λ and the second glass has a refractive index n_2 at λ that is less than n_1.

50. (Previously Presented) The method of claim 49, wherein $n_1 - n_2$ is equal to or greater than 0.01.

51. (Previously Presented) The method of claim 49, wherein $n_1 - n_2$ is equal to or greater than 0.1.

52. (Previously Presented) The method of claim 1, wherein exposing the surface to the first gas composition comprises heating the surface to a temperature between about 80°C and 250°C.

53. (Previously Presented) The method of claim 1, wherein the layers of the first chalcogenide glass and the second glass are layers of a preform and the method further comprises drawing the preform to form a photonic crystal fiber.

54. (Previously Presented) The method of claim 53, wherein the photonic crystal fiber comprises a core and a confinement region surrounding core, where the first chalcogenide glass layer and second glass layer correspond to layers in the confinement region.

55. (Previously Presented) The method of claim 54, wherein the photonic crystal fiber is configured to guide radiation at a wavelength λ and the core has a lower average refractive index at λ than the average refractive index of the confinement region.

56. (Previously Presented) The method of claim 54, wherein the confinement region includes one or more polymer layers.

57. (Previously Presented) The method of claim 56, wherein the layers in confinement region corresponding to the first chalcogenide glass layer and the second glass layer are closer to the core than the one or more polymer layers.

58. (Previously Presented) The method of claim 54, wherein the confinement region includes one or more layers in addition to the layers corresponding to the first chalcogenide glass layer and the second glass layer.

59. (Previously Presented) The method of claim 58, wherein the additional layers comprise one or more additional layers of the first chalcogenide glass.

60. (Previously Presented) The method of claim 58, wherein the additional layers comprise one or more additional layers of the second glass.

61. (Currently Amended) The method of claim [[1]] 30, wherein the tube comprises a polysulfone, a fluoropolymer, polyethylene or a derivative of a polysulfone, a fluoropolymer, or polyethylene.

62. (Currently Amended) The method of claim 1, wherein the ~~portions~~ layer of the first chalcogenide glass and the layer of the second glass are in the form of annular layers.

63. (Currently Amended) The method of claim 36, wherein the ~~first material~~ chalcogenide glass has a refractive index n_1 at a wavelength λ and the oxide glass ~~second material~~ has a refractive index n_2 at λ that is less than n_1.

64. (Previously Presented) The method of claim 36, wherein the inner surface of the tube is heated to a temperature between about 80°C and 250°C while the first gas composition is introduced into the tube.

65. (Currently Amended) The method of claim 36, wherein the chalcogenide glass ~~first material~~ and the layer of the ~~second material~~ oxide glass form layers of a preform and the method further comprises drawing the preform to form a photonic crystal fiber.

66. (Previously Presented) The method of claim 65, wherein the photonic crystal fiber comprises a core and a confinement region surrounding core, where the layers of the preform correspond to layers in the confinement region.

67. (Previously Presented) The method of claim 66, wherein the confinement region includes one or more polymer layers.

68. (Previously Presented) The method of claim 36, wherein the tube comprises a polymer.

69. (Previously Presented) The method of claim 47, wherein the first chalcogenide glass has a refractive index n_1 at a wavelength λ and the oxide glass has a refractive index n_2 at λ, and $n_1 - n_2$ is equal to or greater than 0.1.

70. (Previously Presented) The method of claim 69, wherein $n_1 - n_2$ is equal to or greater than 0.2.

71. (Previously Presented) The method of claim 47, wherein the layers of the first chalcogenide glass and the oxide glass are layers of a preform and the method further comprises drawing the preform to form a photonic crystal fiber.

72. (Previously Presented) The method of claim 71, wherein the photonic crystal fiber comprises a core and a confinement region surrounding core, where the first chalcogenide glass layer and oxide glass layer correspond to layers in the confinement region.

73. (Previously Presented) The method of claim 72, wherein the photonic crystal fiber is configured to guide radiation at a wavelength λ and the core has a lower average refractive index at λ than the average refractive index of the confinement region.

74. (Previously Presented) The method of claim 72, wherein the confinement region includes one or more polymer layers.

75. (Previously Presented) The method of claim 74, wherein the layers in confinement region corresponding to the first chalcogenide glass layer and the oxide glass layer are closer to the core than the one or more polymer layers.

76. (Previously Presented) The method of claim 72, wherein the confinement region includes one or more layers in addition to the layers corresponding to the first chalcogenide glass layer and the oxide glass layer.

77. (Previously Presented) The method of claim 76, wherein the additional layers comprise one or more additional layers of the first chalcogenide glass.

78. (Previously Presented) The method of claim 47, wherein the surface exposed to the first gas composition is an inner surface of a tube.

79. (Previously Presented) The method of claim 78, wherein the tube comprises a polymer.

80. (New) The method of claim 1, further comprising forming a photonic crystal fiber configured to guide radiation at a wavelength λ from the layers of the first chalcogenide glass and the second glass.

81. (New) The method of claim 80, wherein the first chalcogenide glass and the second glass have refractive indexes n_1 and n_2 at λ, respectively, where $n_1 > n_2$.